Opuhala Temperature Logger Instruction

1. **Parts**
   a) Temperature sensor with 2AA battery holder
   b) Amber reclosable bag
   c) Plastic tube and cab

2. **Driver and Software installation**
   a) Download and install CH341 usb controller driver from https://github.com/himalayanelixir/Arduino_USB_Drivers.
   b) Download the Opuhala software from https://www.coral.noaa.gov/opuhala/sensor.html at the bottom under downloads. Then, unzip the file on your computer's desktop.

3. **To record temperature**
   a) Connect a USB cable to a temperature sensor and a Windows or Mac computer.
   b) Open folder "dist" and run file "TempLogger_Win.exe" (for Windows computer) or "TempLogger_Mac.exe" (for Mac computer). It will open a terminal window.
   c) In the terminal window, it will ask "What do you want to do; measure(m), read(r) or clear(c)?". Please type "m" at the end of the question and then hit "Enter" on your keyboard.
   d) It will ask you another question, "All recorded data will be deleted, are you sure? (Y or N)". If you type and enter "Y", the sensor will delete all the data in the memory chip and start recording new data. If you type "N", you exit the software.
   e) After the sensor started recording temperature, put in two AA lithium batteries in the battery holder. We usually used a small zip tie to wrap around both lithium batteries to hold them tight in the holder.
   f) Unplug the USB cable from the computer and the sensor. Then, take a look at an LED labelled "L" on the mainboard whether it is blinking (about every 1 minute). If the LED is blinking, that means the sensor is working.

g) Put the sensor in the amber reclosable bag and put them back inside the plastic tube. Then close the cap tightly by hand.

h) The sensor is ready to be deployed.

4. To read data from the sensor

a) Connect a USB cable to a temperature sensor and a Windows or Mac computer. Also, the computer needs to be connected to the internet.

b) Open folder “dist” and run file “TempLogger_Win.exe” (for Windows computer) or “TempLogger_Mac.exe” (for Mac computer). It will open a terminal window.

c) In the terminal window, it will ask “What do you want to do; measure(m), read(r) or clear(c)?”. Please type “r” at the end of the question and then hit “Enter” on your keyboard.

d) The terminal window will ask the following questions.

   a. Latitude: - Please input the latitude (e.g. 25.736201) where the sensor was deployed and then hit Enter.

   b. Longitude: - Please input the longitude (e.g. -80.177285) where the sensor was deployed.

   c. Depth (meter): Please input the depth where the sensor was deployed.

   d. Deploy Date&Time(UTC): Please input when the sensor was deployed in UTC time and in this format YYYY-MM-DD hh:mm.

   e. Retrieve Date&Time(UTC): Please input when the sensor was retrieved in UTC time and in this format YYYY-MM-DD hh:mm.

e) The data will appear on the desktop of the computer in a zip file. Inside the zip file, there are 4 files: 15_minute_data_sensorID.csv, one_minute_data_sensorID.csv, rawdata_sensorID.csv, and details.txt. All the information that you input will appear in the details.txt file.

f) The data zip file will be automatically sent to AOML/NOAA server.

5. To clear all the data inside the sensor

a. Connect a USB cable to a temperature sensor and a Windows or Mac computer.

b. Open folder “dist” and run file “TempLogger_Win.exe” (for Windows computer) or “TempLogger_Mac.exe” (for Mac computer). It will open a terminal window.

c. In the terminal window, it will ask “What do you want to do; measure(m), read(r) or clear(c)?”. Please type “c” at the end of the question and then hit “Enter” on your keyboard.